

13

is a poly(vinyl alcohol) latex glue. Glues based on vinyl acetate polymers, especially a vinyl acetate which has been hydrolyzed to form a polyvinyl alcohol, are widely available commercially as white glues. After the (top) web 24 is applied, the “sandwich” of glass fiber mat, gypsum slurry and fibrous web material are pressed to the desired wallboard thickness between plates 50 and 52. Alternatively, the webs and slurry can be pressed to the desired thickness with rollers or in another manner. The continuous sandwich of slurry and applied facing materials then is carried by conveyor(s) 54 in the direction of arrow D. Slurry 41 sets as it is carried along.

Conventional methods for interior wallboard production form a shaped region at the edges of the bottom surface of the forming wallboard as it moves down the production line.

After being formed and after the gypsum has sufficiently set, the wallboard is typically cut to desired lengths and dried. To prevent the quality of the tapered edges from being degraded during drying, the board generally is turned over prior to drying.

Although not limited thereby, industrial drying conditions typically used in conventional continuous gypsum board manufacture also can be used in the manufacture of wallboard according to the present invention. Exemplary drying conditions include temperatures of about 2000 to about 600° F., with drying times of about 30 to about 60 minutes, at line speeds of about 70 to about 600 linear feet per minute.

It will be understood that while the invention has been described in conjunction with specific embodiments thereof, the foregoing description and examples are intended to illustrate, but not limit the scope of the invention. Other aspects, advantages and modifications will be apparent to those skilled in the art to which the invention pertains, and these aspects and modifications are within the scope of the invention, which is limited only by the appended claims. Unless otherwise specifically indicated, all percentages are by weight. Throughout the specification and in the claims the term “about” is intended to encompass + or -5%.

The invention claimed is:

1. A gypsum wallboard comprising:

a gypsum core having a planar first face and a planar second face;

a coated non-woven glass fiber mat facing material suitable for level 4 finishing adhered to and covering at least one of the planar first face and the planar second face of the gypsum core, said coated non-woven glass fiber mat facing material having been contacted (i) on a non-coated side and (ii) during preparation of the wallboard with an aqueous gypsum slurry that sets to form the gypsum core,

wherein the non-woven glass fiber mat facing material comprises a majority of glass fibers of a fiber diameter between about 8 and about 11 microns and a fiber length between ¼ and ¾ inch, the glass fibers of the non-woven glass fiber mat facing material being bound together with an adhesive binder comprising an acrylic adhesive binder and

wherein the non-woven glass fiber mat facing material has a coating comprising a dried aqueous mixture comprising (i) a mineral pigment, (ii) a polymer adhesive binder and optionally (iii) an inorganic adhesive binder on a free surface of said non-woven glass mat facing material and said coated non-woven glass mat facing material has a porosity which allows water to evaporate through said coated non-woven glass fiber mat from the gypsum core during the preparation of the wallboard.

14

2. The gypsum wallboard of claim 1 wherein the non-woven glass fiber mat facing material has a basis weight of between 0.8 and 2.2 lb./100 ft.²

3. The gypsum wallboard of claim 1 wherein the non-woven glass fiber mat facing material has a basis weight of between 1 and 2 lb./100 ft.²

4. The gypsum wallboard of claim 1 wherein at least 75 weight percent of the glass fibers of the non-woven glass fiber mat have a fiber length between ¼ and ½ inch.

5. The gypsum wallboard of claim 1 wherein the coated non-woven glass fiber mat has essentially no fibers having a diameter greater than 13 microns.

6. The gypsum wallboard of claim 1 wherein the coating on the coated non-woven glass fiber mat has a dry weight basis of about 30 to about 60 pounds per 1000 square feet of said coated mat.

7. The gypsum wallboard of claim 1 wherein the adhesive binder comprises predominantly an acrylic adhesive binder and the acrylic adhesive binder is a thermoplastic.

8. The gypsum wallboard of claim 7 in which the thermoplastic acrylic adhesive binder has a glass transition temperature of at least about 20° C., but not above about 115° C.

9. A gypsum wallboard comprising:

a gypsum core having a planar first face and a planar second face;

a coated non-woven glass fiber mat facing material suitable for level 4 finishing adhered to and covering at least one of the planar first face and the planar second face of the gypsum core, said coated non-woven glass fiber mat facing material having been contacted (i) on a non-coated side and (ii) during preparation of the wallboard with an aqueous gypsum slurry that sets to form the gypsum core,

wherein the non-woven glass fiber mat facing material comprises glass fibers and wherein at least 75 wt percent of the glass fibers have a fiber diameter between about 8 and about 11 microns and at least 75 wt. percent of the glass fibers have a fiber length between ¼ and ¾ inch, the glass fibers of the non-woven glass fiber mat facing material being bound together with an adhesive binder comprising an acrylic adhesive binder and

wherein the non-woven glass fiber mat has a coating comprising a dried aqueous mixture comprising (i) a mineral pigment, (ii) a polymer adhesive binder and optionally (iii) an inorganic adhesive binder on a free surface of said non-woven glass mat facing material, and said coated non-woven glass mat facing material having a porosity which allows water to evaporate through said coated mat from the gypsum core during preparation of the wallboard.

10. The gypsum wallboard of claim 9 wherein the non-woven glass fiber mat facing material has a basis weight of between 0.8 and 2.2 lb./100 ft.²

11. The gypsum wallboard of claim 9 wherein the non-woven glass fiber mat facing material has a basis weight of between 1 and 2 lb./100 ft.²

12. The gypsum wallboard of claim 9 wherein at least 75 weight percent of the glass fibers of the non-woven glass fiber mat have a fiber length between ¼ and ½ inch.

13. The gypsum wallboard of claim 9 wherein the coated non-woven glass fiber mat has essentially no fibers having a diameter greater than 13 microns.

14. The gypsum wallboard of claim 9 wherein the non-woven glass fiber mat facing material has a basis weight of between 1 and 2 lb./100 ft.²